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09/836,550	04/18/2001	Deok-Hyeon Choe	P56342	6795

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Robert E. Bushnell
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Washington, DC 20005

EXAMINER

PHINNEY, JASON R

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/836,550

Applicant(s)

CHOE ET AL.

Examiner

Jason Phinney

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-- **Th MAILING DATE of this communication appears on the cover sheet with th correspondence address --**
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 25-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 17-21, 23 and 24 is/are rejected.
- 7) ☒ Claim(s) 12-16 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-24, drawn to a tension mask, classified in class 313, subclass 403.
- II. Claims 25-29, drawn to a method for producing the tension mask, classified in class 445, subclass 47.
- III. Claim 30-33, drawn to an exposure mask, classified in class 216, subclass 12.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the tension mask can be made by the materially different process of ablating or lithography.

3. Inventions II and III are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case exposure masks of the instant invention can be used to block material from being deposited onto specific locations of the substrate during a chemical vapor deposition process.

4. Inventions I and III are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for

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making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case the product of the tension mask could be made by using a series of more than two exposure masks to define the shape of the apertures.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

7. During a telephone conversation with Sam Sahota on 4/16/03 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 25-33 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 18 states that “the width of each of the slots at the electron beam **entering** side being wider than at the electron beam entering side.” based on Figure 11 of the Applicant’s disclosure the Examiner believes that this was intended to read “the width of each of the slots at the electron beam **exiting** side being wider than at the electron beam entering side” and has treated it as such for the purposes of examination.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 4-11, 17-21, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,545,402 to Ko in view of U.S. Patent No. 5,856,725 to Ueda.

Regarding Claim 1, Ko discloses a tension mask for a color cathode-ray tube that comprises a plurality of parallel strips separated by a predetermined distance from each other

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(see Figure 10); a plurality of real bridges intersecting adjacent strips among the plurality of parallel strips to define slots (bridges located in between slots #30 in each of the parallel strips in Figure 10), the slots accommodating electron beams to pass through; and a plurality of dummy bridges located in the slots (Figure 10a, #'s 32a and 32b), partially extending between but not intersecting the adjacent strips, the plurality of dummy bridges having projections facing each other without touching. Ko fails to exemplify that the dummy bridges should have an etching boundary located below the middle of the strips.

Regarding Claim 4, Ko discloses that each of the plurality of real bridges should have a planar top surface (see Figures 6a and 10).

Regarding Claim 5, Ko discloses that the top or bottom surface of the real bridges should be at the same level as the surfaces of the adjacent strips (see Figures 6a and 10).

Regarding Claim 6, Ko fails to exemplify that the distance from the bottom of the strips to the etching boundaries of the dummy bridges should be 0.25 times smaller than the thickness of the strips.

Regarding Claim 7, Ko fails to exemplify that the thickness of each of the real bridges at the recessed center of the real bridges should be approximately the same as the distance from the bottom of the strips to the etching boundaries of the dummy bridges.

Regarding Claim 8, Ko fails to exemplify that the distance from the top of the strips to the etching boundaries of the dummy bridges should be larger than the distance from the bottom of the strips to the etching boundaries of the dummy bridges, the top of the strips being on the electron beam emitting side and the bottom of the strips being on the electron beam entering side.

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Ueda, in the similar field of shadow masks, teaches that the mask should be etched so that the etching boundary is located below the middle of the strips in order to intercept or reduce the quantity of directly incident light while allowing reflected light to pass through (see Figure 6 and Column 4, Lines 25-37). By etching the mask of Ko in the manner taught by Ueda the dummy bridges would have an etching boundary located below the middle of the strips, the distance from the bottom of the strips to the etching boundaries of the dummy bridges would be 0.25 times smaller than the thickness of the strips (see Figure 6B), the thickness of each of the real bridges at the recessed center of the real bridges would be approximately the same as the distance from the bottom of the strips to the etching boundaries of the dummy bridges, and the distance from the top of the strips to the etching boundaries of the dummy bridges would be larger than the distance from the bottom of the strips to the etching boundaries of the dummy bridges, the top of the strips being on the electron beam emitting side and the bottom of the strips being on the electron beam entering side.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to etch the tension mask of Ko in the manner taught by Ueda in order to intercept or reduce the quantity of directly incident light while allowing reflected light to pass through.

13. Regarding Claim 9, Ko fails exemplify that the relative position of each of the slots at the beam entering side with respect to the beam emitting side of the tension mask should be shifted toward the center of the tension mask as the locations of the slots become closer to the periphery of the tension mask.

Regarding Claim 10, Ko fails exemplify that the relative position of each of the slots at the beam entering side should be shifted toward the center of the tension mask by etching a portion of each slot on the beam emitting side with a predetermined width, and shifting an etch of a portion of each slot on the beam emitting side with a predetermined width towards the center of the tension mask with respect to the etch of the portion of the slot on the beam emitting side, the etch on the beam emitting side and the etch on the beam entering side forming one of the slots of the tension mask.

Regarding Claim 11, Ko fails to exemplify that the center of the tension mask should be a center line across a width of the tension mask.

Ueda in the description of the prior art teaches that the relative position of each of the slots at the beam entering side with respect to the beam emitting side of the tension mask should be shifted toward the center of the tension mask as the locations of the slots become closer to the periphery of the tension mask wherein the center of the mask is a line across a width of the tension mask and that this shift should be accomplished by etching in order to minimize the quantity of light directly incident to the slots and undesirably reflected by the walls of the slots (see Figure 3 and Column 1, Line 66 – Column 2, Line 19).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to etch the mask of Ko in the manner taught in the prior art section of Ueda in order to minimize the quantity of light directly incident to the slots and undesirably reflected by the walls of the slots.

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14. Regarding Claim 17, Ko fails to exemplify that the adjacent strips should have rounded portions.

Regarding Claim 18, Ko fails to exemplify that the width of each of the slots at the electron beam exiting side should be wider than at the electron beam entering side.

Ueda teaches that the mask should be etched so that the adjacent strips should have rounded portions and the width of each of the slots at the electron beam exiting side should be wider than at the electron beam entering side in order to intercept or reduce the quantity of directly incident light while allowing reflected light to pass through (see Figure 6 and Column 4, Lines 25-37).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to etch the tension mask of Ko in the manner taught by Ueda in order to intercept or reduce the quantity of directly incident light while allowing reflected light to pass through.

15. Claim 19 is directed to the product of the tension mask of Claim 1 therefore the method of manufacture is not germane to the issue of patentability. Ko in view of Ueda teaches the tension mask of Claim 1 as described above.

16. Regarding Claim 20, Ko discloses a tension mask for a color cathode-ray tube that comprises a plurality of parallel strips separated by a predetermined distance from each other (see Figure 10); a plurality of real bridges intersecting adjacent strips among the plurality of parallel strips to define slots (bridges located in between slots #30 in each of the parallel strips in

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Figure 10), the slots accommodating electron beams to pass through; and a plurality of dummy bridges located in the slots (Figure 10a, #'s 32a and 32b), partially extending between but not intersecting the adjacent strips, the plurality of dummy bridges having projections facing each other without touching. Ko fails to exemplify that the dummy bridges should have an etching boundary located below the middle of the strips. Ko further fails to exemplify that there should be a pair of first rounded portions formed with a first thickness at the beam emitting side of each of the slots, partially extending from the adjacent strips; and a pair of second rounded portions formed with a second width at the beam entering side of each of the slots, partially extending from the adjacent strips.

Regarding Claim 24, Ko discloses that each of the plurality of real bridges should have a planar top surface (see Figure 10).

Ueda, in the similar field of shadow masks, teaches that the mask should be etched so that the etching boundary is located below the middle of the strips in order to intercept or reduce the quantity of directly incident light while allowing reflected light to pass through (see Figure 6 and Column 4, Lines 25-37). By etching the mask of Ko in the manner taught by Ueda the dummy bridges would have an etching boundary located below the middle of the strips and there would be a pair of first rounded portions (Figure 5, #26S) formed with a first thickness at the beam emitting side of each of the slots, partially extending from the adjacent strips and a pair of second rounded portions (Figure 5, #26L) formed with a second width at the beam entering side of each of the slots, partially extending from the adjacent strips

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to etch the tension mask of Ko in the manner taught by Ueda in order to

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intercept or reduce the quantity of directly incident light while allowing reflected light to pass through.

17. Regarding Claim 21, Ko fails exemplify that the relative position of each of the slots at the beam entering side with respect to the beam emitting side of the tension mask should be shifted toward the center of the tension mask as the locations of the slots become closer to the periphery of the tension mask.

Ueda in the description of the prior art teaches that the relative position of each of the slots at the beam entering side with respect to the beam emitting side of the tension mask should be shifted toward the center of the tension mask as the locations of the slots become closer to the periphery of the tension mask in order to minimize the quantity of light directly incident to the slots and undesirably reflected by the walls of the slots (see Figure 3 and Column 1, Line 66 – Column 2, Line 19).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to etch the mask of Ko in the manner taught in the prior art section of Ueda in order to minimize the quantity of light directly incident to the slots and undesirably reflected by the walls of the slots.

18. Claims 1-3, 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,545,402 to Ko in view of U.S. Patent No. 3,883,770 to Yamada.

Regarding Claim 1, Ko discloses a tension mask for a color cathode-ray tube that comprises a plurality of parallel strips separated by a predetermined distance from each other

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(see Figure 10); a plurality of real bridges intersecting adjacent strips among the plurality of parallel strips to define slots (bridges located in between slots #30 in each of the parallel strips in Figure 10), the slots accommodating electron beams to pass through; and a plurality of dummy bridges located in the slots (Figure 10a, #'s 32a and 32b), partially extending between but not intersecting the adjacent strips, the plurality of dummy bridges having projections facing each other without touching. Ko fails to exemplify that the dummy bridges should have an etching boundary located below the middle of the strips.

Regarding Claim 2, Ko fails to exemplify that the plurality of real bridges should be recessed by a predetermined depth from the top surface of the real bridges and that the thickness of each of the real bridges should be smaller at the center than at the periphery of the real bridges.

Regarding Claim 3, Ko fails to exemplify that the thickness of each of one the real bridges at the recessed center of the real bridges should be approximately the same as the distance from the bottom of the strips to the etching boundaries of the dummy bridges.

Yamada in the similar field of tension masks teaches that the mask should be etched so that the etching boundary is located below the middle of the strips in order to minimize the halation caused by an electron beam (see Figures 1 and 4). By etching the mask of Ko in the manner taught by Yamada the dummy bridges would have an etching boundary located below the middle of the strips, the plurality of real bridges would be recessed by a predetermined depth from the top surface of the real bridges and that the thickness of each of the real bridges should be smaller at the center than at the periphery of the real bridges (Figure 4, #3), and the thickness of each of one the real bridges at the recessed center of the real bridges would be approximately

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the same as the distance from the bottom of the strips to the etching boundaries of the dummy bridges.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to etch the tension mask of Ko in the manner taught by Yamada in order to minimize the halation caused by the electron beam.

19. Regarding Claim 20, Ko discloses a tension mask for a color cathode-ray tube that comprises a plurality of parallel strips separated by a predetermined distance from each other (see Figure 10); a plurality of real bridges intersecting adjacent strips among the plurality of parallel strips to define slots (bridges located in between slots #30 in each of the parallel strips in Figure 10), the slots accommodating electron beams to pass through; and a plurality of dummy bridges located in the slots (Figure 10a, #'s 32a and 32b), partially extending between but not intersecting the adjacent strips, the plurality of dummy bridges having projections facing each other without touching. Ko fails to exemplify that the dummy bridges should have an etching boundary located below the middle of the strips. Ko further fails to exemplify that there should be a pair of first rounded portions formed with a first thickness at the beam emitting side of each of the slots, partially extending from the adjacent strips; and a pair of second rounded portions formed with a second width at the beam entering side of each of the slots, partially extending from the adjacent strips.

Regarding Claim 23, Ko fails to exemplify that the plurality of real bridges should be recessed by a predetermined depth from the top surface of the real bridges, and the thickness of each of the real bridges should be smaller at the center than at the periphery of the real bridges.

Yamada in the similar field of tension masks teaches that the mask should be etched so that the etching boundary is located below the middle of the strips in order to minimize the halation caused by an electron beam (see Figures 1 and 4). By etching the mask of Ko in the manner taught by Yamada the dummy bridges would have an etching boundary located below the middle of the strips, there would be a pair of first rounded portions (Figure 4, #2c) formed with a first thickness at the beam emitting side of each of the slots, partially extending from the adjacent strips and a pair of second rounded portions (Figure 4, #2b) formed with a second width at the beam entering side of each of the slots, partially extending from the adjacent strips, and the plurality of real bridges would be recessed by a predetermined depth from the top surface of the real bridges and that the thickness of each of the real bridges should be smaller at the center than at the periphery of the real bridges (Figure 4, #3).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to etch the tension mask of Ko in the manner taught by Yamada in order to minimize the halation caused by the electron beam.

Allowable Subject Matter

20. Claims 12-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. The following is a statement of reasons for the indication of allowable subject matter:

22. Regarding Claims 12 and 22, the prior art of record and relied upon fails to show or suggest a tension mask having all the features of independent claims 1 and 20 respectively and

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further limited in that the relative position of the gap between the facing dummy bridges should be shifted toward the center or the periphery of the tension mask as the locations of the dummy bridges become closer to the periphery of the tension mask. A tension mask with the above features would further reduce the reflected incident light.

Claims 13 and 15 further limit Claim 12 and as such also contain allowable subject matter

Regarding Claim 14, the prior art of record and relied upon fails to show or suggest a tension mask having all the features of independent claim 1 and further limited in that the width of each of the dummy bridges along the strips should become narrow as the locations of the dummy bridges come closer to the periphery of the tension mask. A tension mask according to the instant invention would prevent clipping of the electron beam.

Regarding Claim 16, the prior art of record and relied upon fails to show or suggest a tension mask having all the features of independent claim 1 and further limited in that the area of each of the dummy bridges should become smaller as the locations of the dummy bridges come closer to the periphery of the tension mask. A tension mask according to the instant invention would prevent clipping of the electron beam.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Phinney whose telephone number is (703) 305-3999. The examiner can normally be reached on M-F 7:30-4:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



JP
May 1, 2003



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